

1. A servo system for a magnetic tape drive, said servo system for positioning a tape head laterally with respect to a plurality of parallel, longitudinal servo bands of a magnetic tape, said tape head having a plurality of data read transducers, said magnetic tape drive having a data flow system for reading data sensed by said plurality of data read transducers, said servo system

5 comprising:

at least one servo head positioned on said tape head;

at least one servo read channel for detecting servo signals of said servo bands of said

magnetic tape;

a servo actuator for positioning said tape head laterally with respect to said magnetic tape;

10 an agent for selectively directing signals sensed by said data read transducers of said tape head to said at least one servo read channel; and

a control system:

responding to said detected servo signals of said servo bands from said at least

one servo read channel for operating said servo actuator to position said tape head

15 laterally with respect to said servo bands;

responding to loss of information about the lateral position of said tape head,

operating said agent to selectively direct signals sensed by said data read

transducers to said at least one servo read channel; and

upon said at least one servo read channel detecting a servo signal representing one

20 of said servo bands from a sensed said data read transducer, determining the lateral

position of said tape head with respect to said detected servo band based upon the

position of said data read transducer that sensed said detected servo signal.

2. The servo system of Claim 1, wherein said control system operates said agent to selectively direct signals sensed by said data read transducers to said at least one servo read channel in a sequence.
3. The servo system of Claim 1, wherein said at least one servo head comprises at least one servo head at either lateral side of said plurality of data read transducers of said tape head, and wherein said control system additionally determines the direction of motion of said tape head required to move a selected said servo head toward the position of said data read transducer that sensed said detected servo signal.
4. The servo system of Claim 1, wherein, as said tape head is moved laterally with respect to said magnetic tape, such that said at least one servo head and at least one servo read channel no longer detect said servo signals; said control system operates said agent to direct signals sensed by said data read transducers to said at least one servo read channel to monitor lateral movement of said tape head.

5. The servo system of Claim 1, wherein said control system, in response to said loss of information about lateral position, and upon operating said agent and said at least one servo read channel detecting said servo signal from a sensed said data read transducer, determines the lateral distance motion by said servo actuator of said tape head required to 5 move a servo head of said tape head laterally to the servo band sensed by said data read transducer that sensed said detected servo signal; and operates said servo actuator to position said tape head laterally in accordance with said determined lateral motion.

6. The servo system of Claim 5, wherein said servo actuator comprises at least a coarse 10 actuator; and said control system additionally, in response to said loss of information about said lateral position, operates said coarse actuator to hold steady; and, upon determining said position of said tape head, operates said coarse actuator to position said tape head laterally in accordance with said determined lateral position.

7. A method for recovery of lateral position of a servo system of a magnetic tape drive, said servo system for positioning a tape head laterally with respect to a plurality of parallel, longitudinal servo bands of a magnetic tape, said tape head having at least one servo head and a plurality of data read transducers, said magnetic tape drive having a data flow system for reading data sensed by said plurality of data read transducers, said servo system sensing lateral position of said at least one servo head with respect to at least one of said servo bands, said method comprising:

responding to loss of information about the lateral position of said tape head, selectively senses said data read transducers of said tape head;

10 detecting servo signal representing said servo bands from said sensed data read transducers; and

upon detecting a servo signal representing one of said servo bands from a sensed said data read transducer, determining the lateral position of said tape head with respect to said detected servo band based upon the position of said data read transducer that sensed said detected servo

15 signal.

8. The method of Claim 7, wherein said selected sensing step comprises sensing selected said data read transducers in a sequence.

9. The method of Claim 7, wherein said servo system comprises at least one servo read channel, and wherein said selected sensing step comprises providing the sensed output of said 20 selected data read transducers to said at least one servo read channel in a sequence.

10. The method of Claim 7, wherein said tape head comprises at least one servo head at either lateral side of said plurality of data read transducers, and wherein said lateral position determining step additionally comprises determining the direction of motion of said tape head required to move a selected said servo head to the position of said data read transducer that 5 sensed said detected servo signal.

11. The method of Claim 7, wherein, as said tape head is moved laterally with respect to said magnetic tape, such that said at least one servo head no longer senses servo signals; said method selectively senses said data read transducers to detect servo signals to monitor lateral movement of said tape head.

10 12. The method of Claim 7, wherein, said servo system additionally comprises a servo actuator for positioning said tape head laterally with respect to said magnetic tape; said method, in response to said loss of information about lateral position, and upon conducting said selecting and detecting steps; said determining step comprises determining the lateral distance motion by said servo actuator required to move a servo head of said tape head laterally to the servo band 15 sensed by said data read transducer that sensed said detected servo signal.

13. A magnetic tape drive for reading and/or writing data with respect to a magnetic tape, said magnetic tape having a plurality of parallel, longitudinal servo bands and a plurality of data tracks parallel to and separating said servo bands, comprising:
a tape head having at least one servo head and a plurality of data read and/or write 20 transducers;

a drive system for moving a magnetic tape longitudinally with respect to said tape head to allow said at least one servo head and the plurality of data read transducers of said data read and/or write transducers to sense said magnetic tape;

a data flow system for reading and/or writing data from said magnetic tape with respect to 5 said data read and/or write transducers;

at least one servo head positioned on said tape head;

at least one servo read channel for detecting servo signals of said servo bands of said magnetic tape;

a servo actuator for positioning said tape head laterally with respect to said magnetic tape;

10 an agent for selectively directing signals sensed by said data read transducers of said tape head to said at least one servo read channel; and

a control system:

responding to said detected servo signals of said servo bands from said at least one servo read channel for operating said servo actuator to position said tape head laterally with respect to said servo bands;

15 responding to loss of information about the lateral position of said tape head, operating said agent to selectively direct signals sensed by said data read transducers to said at least one servo read channel; and

upon said at least one servo read channel detecting a servo signal representing one of said servo bands from a sensed said data read transducer, determining the lateral position of said tape head with respect to said detected servo band based upon the position of said data read transducer that sensed said detected servo signal.

14. The magnetic tape drive of Claim 13, wherein said control system operates said switching agent to selectively direct signals sensed by said data read transducers to said at least one servo read channel in a sequence.

15. The magnetic tape drive of Claim 13, wherein said at least one servo head comprises at 5 least one servo head at either lateral side of said plurality of data read transducers of said tape head, and wherein said control system additionally determines the direction of motion of said tape head required to move a selected said servo head toward the position of said data read transducer that sensed said detected servo signal.

16. The magnetic tape drive of Claim 13, wherein, as said tape head is moved laterally with 10 respect to said magnetic tape, such that said at least one servo head and at least one servo read channel no longer detect said servo signals; said control system operates said agent to direct signals sensed by said data read transducers to said at least one servo read channel to monitor lateral movement of said tape head.

17. The magnetic tape drive of Claim 13, wherein said control system, in response to said loss of information about lateral position, and upon operating said agent and said at least one servo read channel detecting said servo signal from a sensed said data read transducer, determines the lateral distance motion by said servo actuator of said tape head required to 5 move a servo head of said tape head laterally to the servo band sensed by said data read transducer that sensed said detected servo signal; and operates said servo actuator to position said tape head laterally in accordance with said determined lateral motion.

18. The magnetic tape drive of Claim 17, wherein said servo actuator comprises at least a 10 coarse actuator; and said control system additionally, in response to said loss of information about said lateral position, operates said coarse actuator to hold steady; and, upon determining said position of said tape head, operates said coarse actuator to position said tape head laterally in accordance with said determined lateral position.

19. A servo recovery system for recovery of lateral position of a servo system of a magnetic tape drive, said servo system for positioning a tape head laterally with respect to a plurality of parallel, longitudinal servo bands of a magnetic tape, said tape head having at least one servo head and a plurality of data read transducers, said magnetic tape drive having a drive system for 5 moving a magnetic tape longitudinally with respect to said tape head, said servo system sensing lateral position of said at least one servo head with respect to at least one of said servo bands, said servo system comprising at least one servo read channel for detecting servo signals of said servo bands of said magnetic tape, said servo recovery system comprising:

an agent for selectively directing signals sensed by said data read transducers of said tape 10 head to said at least one servo read channel; and

a control system:

responding to loss of information about the lateral position of said tape head, operating said drive system to move said magnetic tape at a longitudinal velocity within a predetermined velocity window;

15 operating said agent to selectively direct signals sensed by said data read transducers to said at least one servo read channel; and

upon said at least one servo read channel detecting a servo signal representing one of said servo bands from a sensed said data read transducer, determining the lateral distance motion of said tape head required to move a servo head of said tape head 20 laterally to the position of said data read transducer that sensed said detected servo signal.

20. The servo recovery system of Claim 19, wherein said control system operates said agent to selectively direct signals sensed by said data read transducers to said at least one servo read channel in a sequence.

21. The servo recovery system of Claim 1, wherein said at least one servo head comprises at least one servo head at either lateral side of said plurality of data read transducers of said tape head, and wherein said control system determines said lateral motion, and additionally determines the direction of motion of said tape head required to move a selected said servo head toward the position of said data read transducer that sensed said detected servo signal.

22. The servo recovery system of Claim 21, wherein said at least one servo read channel comprises at least two servo read channels, said servo read channels respectively for said servo heads at either lateral side of said plurality of data read transducers, and wherein said control system operates said agent to selectively direct signals sensed by a separate said data read transducer to each of said servo read channels in a sequence.

23. The servo recovery system of Claim 22, wherein said control system operates said agent to selectively direct signals sensed by said data read transducers in a sequence from the laterally outermost of said tape head at both ends of said tape head, to the center of said tape head.

24. The servo recovery system of Claim 19, wherein said servo system comprises a servo actuator for positioning said tape head laterally with respect to said magnetic tape; and said control system additionally responds to said loss of said lateral position, operates said actuator to hold steady; and, upon determining said lateral motion, operates said actuator to position said 5 tape head laterally in accordance with said determined lateral motion to move a servo head of said tape head laterally to the position of said data read transducer that sensed said detected servo signal.

25. A computer program product usable with at least one programmable computer processor having computer readable code embodied therein, said at least one programmable computer processor for operating a servo system of a magnetic tape drive, said servo system for positioning a tape head laterally with respect to a plurality of parallel, longitudinal servo bands of a magnetic 5 tape, said tape head having at least one servo head and a plurality of data read transducers, said magnetic tape drive having a data flow system for detecting data sensed by said plurality of data read transducers, said servo system sensing lateral position of said at least one servo head with respect to at least one of said servo bands, said computer program product comprising:

computer readable program code causing said at least one programmable computer 10 processor to respond to loss of information about the lateral position of said tape head, operating said servo system to selectively sense said data read transducers of said tape head;

computer readable program code causing said at least one programmable computer processor to operate said servo system to detect servo signals representing said servo bands from said sensed data read transducers; and

15 computer readable program code causing said at least one programmable computer processor to, upon said servo system detecting a servo signal representing one of said servo bands from a sensed said data read transducer, determine the lateral position of said tape head with respect to said detected servo band based upon the position of said data read transducer that sensed said detected servo signal.

26. The computer program product of Claim 25, wherein said computer readable program code causing said at least one programmable computer processor to operate said servo system to sense selected said data read transducers of said tape head, comprises causing said at least one programmable computer processor to operate said servo system to sense selected said data read 5 transducers in a sequence.

27. The computer program product of Claim 25, wherein said servo system comprises at least one servo read channel, and wherein said computer readable program code causing said at least one programmable computer processor to operate said servo system to sense selected said data read transducers of said tape head, comprises causing said at least one programmable computer 10 processor to operate said servo system to provide the sensed output of said selected data read transducers to said at least one servo read channel in a sequence.

28. The computer program product of Claim 25, wherein said tape head comprises at least one servo head at either lateral side of said plurality of data read transducers, and wherein said computer readable program code causing said at least one programmable computer processor to 15 determine the lateral position of said detected servo band, additionally comprises computer readable program code causing said at least one programmable computer processor to determine the direction of motion of said tape head required to move a selected said servo head toward the position of said data read transducer that sensed said detected servo signal.

29. The computer program product of Claim 25, wherein, as said tape head is moved laterally with respect to said magnetic tape, such that said at least one servo head no longer senses servo signals; said computer readable program code causing said at least one programmable computer processor to operate said servo system to selectively sense selected said data read transducers of
5 said tape head and to detect servo signals, comprise causing said at least one programmable computer processor to operate said servo system to selectively sense said data read transducers and detect servo signals to monitor lateral movement of said tape head.

30. The computer program product of Claim 25, wherein said servo system additionally comprises a servo actuator for positioning said tape head laterally with respect to said magnetic
10 tape; and wherein said computer readable program code causing said at least one programmable computer processor to determine the lateral position of said detected servo band, additionally comprises computer readable program code causing said at least one programmable computer processor, in response to said loss of information about said lateral position, to determine the lateral distance motion by said servo actuator required to move a servo head of said tape head
15 laterally to the servo band sensed by said data read transducer that sensed said detected servo signal.